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III. *Observations on the Bills of Mortality at York.* By William White, M. D. F. A. S.; communicated by Nathaniel Pigott, Esq. F. R. S.

Read December 6, 1781.

FAITHFUL and accurate registers of the number of births and deaths kept in different places are of great importance to the community. The statesman, the philosopher, and the physician, are equally interested in inquiries which infallibly shew us the real state of the nation, as to population, healthfulness, and, as connected with the latter, virtue and temperance.

It must give great pleasure to a reflecting mind, to find, from undeniable proofs, that this nation appears to be, in the above respects, in a general and progressive state of improvement. The births have become more numerous, the deaths fewer, in proportion in almost every place where the registers have been consulted: for proof of this I refer to the Transactions of the Royal Society, vol. LVII. LIX. LXI. LXIV. LXV. &c. and to a publication of Mr. WALES, F. R. S. intituled, An Inquiry into the present State of Population in England and Wales, lately published.

It would not perhaps be difficult, and as a physician I could with pleasure attempt the investigation, to discover the various

causes to which such effects may be attributed ; but here a wide field offers itself to our examination. It will, however, be necessary just to point out such as affect this city in particular, in a subsequent part of this paper.

Mr. DRAKE, F. R. S. in his *Antiquities of York*, has given us the number of births and burials for 7 years, from August 5, 1728 to August 5, 1735, inclusive. This gave a favourable opportunity of comparing our present state after an elapse of 45 years. In order to this, the different parish registers were carefully examined from January 1, 1770, to December 31, 1776, inclusive : I added the number of males and females for the latter term, which Mr. DRAKE omitted.

TABLE I. The number of births and burials in York from August 5, 1728, to August 5, 1735.

The different parishes.	Births.	Burials.
All Saints, Pavement,	123	218
All Saints, North-street,	101	111
St. Crux,	132	159
St. Cuthbert's,	55	80
St. Dyonis,	92	106
St. Helen's,	113	122
St. John's,	136	173
St. Laurence,	60	77
Martin's, Conyngs-street,	73	110
Michael le Belfray,	310	327
St. Mary's, Castle-gate,	150	221
St. Michael, Spurrier-gate,	198	216
St. Martin's, Mickle-gate,	92	117
Bishophill the elder,	103	117
Bishophill the younger,	57	73
St. Maurice,	55	158
St. Margaret's	118	147
St. Olave's,	147	181
St. Saviour's,	70	103
St. Sampson's,	188	228
Christ Church,	140	119
Trinity, Goodramgate,	143	144
Trinity, Mickle-gate,	129	152
Dissenters,	18	29
	<hr/> 2803	<hr/> 3488

The burials, therefore, exceeded the births 685 in 7 years, or 98 annually.

TABLE II. The number of births and burials from January 1, 1770, to December 31, 1776, inclusive.

The different parishes.	Births.	Burials.
All Saints, Pavement,	240	153
All Saints, North-street,	96	88
St. Crux,	146	109
St. Cuthbert's,	102	126
St. Dyonis,	109	96
St. Helen's,	96	76
St. John's	183	124
St. Laurence,	97	83
Martin's, Conyng-street,	104	74
Michael le Belfray,	297	298
St. Mary's, Castle-gate,	159	210
St. Michael's, Spurrier-gate.	151	113
Martin's, Mickle-gate,	82	98
Bishophill the elder,	124	151
Bishophill the younger,	121	92
St. Maurice,	76	138
St. Margaret's,	182	142
St. Olave's,	234	296
St. Saviour's,	96	108
Sampson's,	174	184
Christ Church,	147	110
Trinity, Goodram-gate,	161	118
Trinity, Mickle-gate,	122	164
Diffenters,	24	24
	<hr/> 3323	<hr/> 3175

Decreased in burials 313 , or $44\frac{5}{7}$ annually.

Births increased 520 , or $74\frac{2}{7}$ ditto.

Births exceed the burials 148 , or $21\frac{1}{7}$, ditto.

TABLE III. The number of births and burials, with the proportion of males and females, annually, from January 1, 1770, to December 31, 1776.

	Births.	Males.	Females.	Burials.	Males.	Females.
1770	467	237	230	417	203	214
1771	451	225	226	485	225	260
1772	490	238	252	508	220	288
1773	474	244	232	499	241	258
1774	453	214	239	382	173	209
1775	490	255	243	488	237	251
1776	498	255	243	396	177	219
	<u>3323</u>	<u>1666</u>	<u>1657</u>	<u>3175</u>	<u>1476</u>	<u>1699</u>

Number of males born in 7 years 1666, or 238 annually.

Number of males buried in 7 years 1476, or 210 $\frac{6}{7}$ annually.

Number of females born in 7 years 1657, or 236 $\frac{4}{7}$ annually.

Number of females buried in 7 years 1699, or 242 $\frac{5}{7}$ annually.

TABLE IV. Mortality of the seasons.

Winter.	Spring.	Summer.	Autumn.
Jan. 320	Apr. 277	July 220	Oct. 237
Feb. 282	May 265	Aug. 237	Nov. 230
Mar. 316	June 274	Sept. 225	Dec. 292
<u>918</u>	<u>816</u>	<u>682</u>	<u>759</u>

In order to find the number of inhabitants in any place, where, either from its bulk, or other reasons, a numerical survey cannot be obtained, two methods may be made use of. The first is, multiplying the number of houses by the medium of inhabitants in each. The second is, one recommended by Monf. MOHEAN, in a work, intituled, *Recherches et Considera-*

tions sur la Population de la France. He found, by very laborious calculations, that the number of inhabitants may be known by the births, the latter being to the former as nearly 1 to 27.

By an account given into the House of Commons in March 1781, the number of houses in York subject to the new house-tax was 2285: if to those be added such as were too small to come under the tax, which may probably amount to one-third more, the total of the houses in York will be about 3000. This number multiplied by $4\frac{1}{4}$, which is nearly the medium of people in a house, gives 12,750 for the number of inhabitants.

By the second rule we have 12,798 for the number of inhabitants, which is the result of 474, the average annual births, multiplied by 27.

The remarkable coincidence of the above methods of calculation makes it very probable, that if we estimate the number of inhabitants at 12,800, we shall not be far from the truth.

However this may be as to the exact number of inhabitants, it affects not the principal end of the present inquiry, which is to shew how we are improved in population and healthfulness within 40 years past.

In order to prove this, we must find the number of inhabitants in the year 1735, from tab. 1. We there find the average annual births to be 400; this multiplied by 27 gives 10,800 for the number at that time. This number divided by the average annual deaths 498, gives the proportion of deaths 1 in $21\frac{1}{4}$. Such was the state of this city as to mortality 46 years ago.

Very different from this is our present situation, the proportion of deaths being now decreased to 1 in $28\frac{1}{4}$, which is the quotient of 12,800, the number of inhabitants divided by 453,

the present average of annual deaths. This is certainly a great rise in the scale of healthiness. From being near as fatal as London we have become less so than many country places, as will appear from the following comparative view of the proportion of deaths in different places.

At Vienna,	-	1 in $19\frac{1}{2}$ dies every year
London,	-	1 in $20\frac{3}{4}$
Edinburgh,		1 in $20\frac{2}{5}$
Berlin,	-	1 in 21
Rome,	-	1 in 22
Amsterdam,		1 in 22
Dublin,	-	1 in 22
Leeds,	-	1 in 22
Northampton,		1 in 26
Shrewsbury,		1 in 26
Liverpool,		1 in $27\frac{7}{10}$
Manchester,		1 in 28
York,	-	1 in $28\frac{1}{2}$

Hence in 1735, at York it would require $21\frac{1}{2}$ years to bury a number equal to that of its inhabitants; but in 1776, $28\frac{1}{2}$ years would be required for the same. One third less die yearly now than in the former period; and we are certainly advancing still higher, for in 1777 the births were more than in any former year, being 516, the burials 464.

As there is no settled manufactory here, there is little increase or decrease of the people by acquisition or emigration, and probably what may happen in either case is nearly balanced by the other.

It appears from tab. 4. that the summer season is by much the healthiest at York; autumn the next; then the spring; winter being by far the most fatal. Dr. PERCIVAL found much

the same to be the case at Manchester. At Chester Dr. HAYGARTH says November was the most sickly month. The differences in the registers make it impossible to give the diseases of which the individuals died; yet a general idea of this may be obtained from the same table. By the care and attention of the present archbishop of this province, this may be easily perfected in future periods.

It appears from hence, that our diseases are chiefly of the inflammatory kind, which physicians know to be the general attendants of the winter and spring months. The disorders of the summer and autumn are more particularly such as arise from putrescency and acrimony, such as flow and remitting fevers, dysenteries, cholera's, and the like, those then being with us the healthiest seasons shew that we are not subject to putrid diseases. Dr. WINTRINGHAM has given us an account of the weather and the corresponding diseases at York for sixteen years successively, in his *Commentarium Nosologicum*, to which learned work I refer the curious reader for further satisfaction upon this subject.

Among the general causes of our increasing population and healthiness we may enumerate the introduction of inoculation, which has been the means of saving a number of lives; improvements in the treatment and cure of several disorders, the cool regimen in fevers, the admission of fresh air, the general use of antiseptic medicines and diet, have doubtless had a salutary and extensive influence upon the health of mankind, and have much obviated the malignity of some of our most dangerous diseases. To these may be added a general improvement and greater attention to nature in the management of infants.

After

After the general causes of healthiness, such as are particular, or of a more local nature, come under consideration. In this respect the city of York has been much improved within a few years past. The streets have been widened in many places, by taking down a number of old houses built in such a manner as almost to meet in the upper stories, by which the sun and air were almost excluded in the streets and inferior apartments. They have also been new paved, additional drains made, and, by the present method of conducting the rain from the houses, are become much drier and cleaner than formerly. The erection of the locks, about four miles below the city, has been a great advantage to it: for, before this, the river was frequently very low, leaving quantities of fludge and dirt in the very heart of the city, also the filth of the common sewers which it was unable to wash away. The lock has effectually prevented this for the future, by the river being kept always high, broad, and spacious; and has thus contributed to the salubrity as well as beauty of York. In the above improvements, in others that are intended to take place, in the care and expence necessary to keep in proper repair the public walks about the city, the magistrates have exerted much public spirit, and have added to the health as well as consulted the convenience of its inhabitants.

York,
Sept. 8, 1781.

